

Claims:

1. An E_{op} process for bleaching chemical pulp, which comprises:
providing said chemical pulp;
providing an E_{op} aqueous bleaching solution comprising a peroxide
5 compound, an oxygen-containing material, sodium hydroxide and magnesium
hydroxide, in the absence of magnesium sulfate; and
bleaching said chemical pulp with said E_{op} aqueous bleaching solution to
form E_{op} bleached chemical pulp.
2. The process of claim 1, wherein the amount of sodium hydroxide in
10 said E_{op} aqueous bleaching solution is at not more than about 8 % by weight, based
on the O.D. weight of said E_{op} chemical pulp.
3. The process of claim 1, wherein the ratio of sodium hydroxide to
magnesium hydroxide in said E_{op} aqueous bleaching solution is not more than
about 5:1 (based on an OH⁻ molar ratio).
- 15 4. The process of claim 1, wherein the pulp viscosity of a final
bleached chemical pulp is at least substantially the same as the final pulp viscosity
of bleached chemical pulp which is bleached with the same total amount of an E_{op}
aqueous bleaching solution comprising said peroxide compound, an oxygen-
containing material, sodium hydroxide, with or without magnesium sulfate, in the
20 absence of magnesium hydroxide.
5. The process of claim 1, wherein the final pulp brightness of said E_{op}
bleached chemical pulp produced from the E_{op} bleached chemical pulp is at least
substantially the same as the final pulp brightness of bleached chemical pulp which
is bleached with same bleach sequence containing the same total amount of an E_{op}
25 aqueous bleaching solution comprising said peroxide compound, an oxygen-
containing material, sodium hydroxide, with or without magnesium sulfate, in the
absence of magnesium hydroxide.
6. The process of claim 1, wherein the COD of bleach effluent from
an E_{op} stage using said E_{op} aqueous bleaching solution is less than the COD of
30 bleach effluent from an E_{op} stage which uses the same total amount of an E_{op}
aqueous bleaching solution comprising said peroxide, an oxygen-containing

material compound, sodium hydroxide, with or without magnesium sulfate, in the absence of magnesium hydroxide.

7. The process of claim 1, which further includes the step of providing an E_p aqueous bleaching solution comprising a peroxide compound, sodium hydroxide and magnesium hydroxide, in the absence of magnesium sulfate; and bleaching said E_{op} bleached chemical pulp with said E_p aqueous bleaching solution to form E_p bleached chemical pulp.

8. The process of claim 1, which further includes the step of providing an E_p aqueous bleaching solution consisting essentially of a peroxide compound, sodium hydroxide and magnesium hydroxide; and bleaching said E_{op} bleached chemical pulp with said E_p aqueous bleaching solution to form E_p bleached chemical pulp.

9. The process of claim 1, wherein the wet zero span tensile strength of said E_{op} bleached chemical pulp is at least substantially the same as the wet zero span tensile strength of bleached chemical pulp which is bleached with the same total amount of an E_{op} aqueous bleaching solution comprising said peroxide compound, an oxygen-containing material, sodium hydroxide, with or without magnesium sulfate, in the absence of magnesium hydroxide.

10. The process of claim 1, wherein the COD in the bleach effluent of said bleached E_{op} chemical pulp is at least about 5 % less than the COD in beach effluent of said bleached chemical pulp which is bleached with the same total amount of an E_{op} aqueous bleaching solution comprising said peroxide compound, an oxygen-containing material, sodium hydroxide, with or without magnesium sulfate, in the absence of magnesium hydroxide.

11. An E_{op} process for bleaching chemical pulp, which comprises:
providing said chemical pulp;

providing an E_{op} aqueous bleaching solution consisting essentially of a peroxide compound, an oxygen-containing material, sodium hydroxide and magnesium hydroxide; and

bleaching said chemical pulp with said E_{op} aqueous bleaching solution to form said bleached chemical pulp.

12. The process of claim 11, wherein the amount of sodium hydroxide in said E_{op} aqueous bleaching solution is at not more than about 8 % by weight, based on the O.D. weight of said E_{op} chemical pulp.

13. The process of claim 11, wherein the ratio of sodium hydroxide to magnesium hydroxide in said E_{op} aqueous bleaching solution is not more than about 5:1 (based on an OH⁻ molar ratio).

14. The process of claim 11, wherein the pulp viscosity of a final bleached chemical pulp produced from the E_{op} bleached chemical pulp is at least substantially the same as the final pulp viscosity of bleached chemical pulp which is bleached with the same total amount of an E_{op} aqueous bleaching solution comprising said peroxide compound, an oxygen-containing material, sodium hydroxide, with or without magnesium sulfate, in the absence of magnesium hydroxide.

15. The process of claim 11, wherein the final pulp brightness of said E_{op} bleached chemical pulp is at least substantially the same as the final pulp brightness of bleached chemical pulp which is bleached with same bleach sequence containing the same total amount of an E_{op} aqueous bleaching solution comprising said peroxide compound, an oxygen-containing material, sodium hydroxide, with or without magnesium sulfate, in the absence of magnesium hydroxide.

16. The process of claim 11, wherein the COD of bleach effluent from an E_{op} stage using said E_{op} aqueous bleaching solution is less than the COD of bleach effluent from an E_{op} stage which uses the same total amount of an E_{op} aqueous bleaching solution comprising said peroxide, an oxygen-containing material compound, sodium hydroxide, with or without magnesium sulfate, in the absence of magnesium hydroxide.

17. The process of claim 11, which further includes the step of providing an E_p aqueous bleaching solution comprising a peroxide compound, sodium hydroxide and magnesium hydroxide, in the absence of magnesium sulfate; and bleaching said E_{op} bleached chemical pulp with said E_p aqueous bleaching solution to form E_p bleached chemical pulp.

18. The process of claim 11, which further includes the step of providing an E_p aqueous bleaching solution consisting essentially of a peroxide compound, sodium hydroxide and magnesium hydroxide; and bleaching said E_{op} bleached chemical pulp with said E_p aqueous bleaching solution to form E_p bleached chemical pulp.

19. The process of claim 11, wherein the wet zero span tensile strength of said E_{op} bleached chemical pulp is at least substantially the same as the wet zero span tensile strength of bleached chemical pulp which is bleached with the same total amount of an E_{op} aqueous bleaching solution comprising said peroxide compound, an oxygen-containing material, sodium hydroxide, with or without magnesium sulfate, in the absence of magnesium hydroxide.

20. The process of claim 11, wherein the COD in the bleach effluent of said bleached E_{op} chemical pulp is at least about 5 % less than the COD in bleach effluent of said bleached chemical pulp which is bleached with the same total amount of an E_{op} aqueous bleaching solution comprising said peroxide compound, an oxygen-containing material, sodium hydroxide, with or without magnesium sulfate, in the absence of magnesium hydroxide.

21. An E_{op} aqueous chemical solution for bleaching chemical pulp, which comprises an E_{op} aqueous bleaching solution consisting essentially of a peroxide compound, an oxygen-containing material, sodium hydroxide and magnesium hydroxide.

22. The E_{op} aqueous bleaching solution of claim 21, wherein the amount of sodium hydroxide in said E_{op} aqueous bleaching solution is at not more than about 8% by weight, based on the O.D. weight of said chemical pulp.

23. The E_{op} aqueous bleaching solution of claim 21, wherein the ratio of sodium hydroxide to magnesium hydroxide in said E_{op} aqueous bleaching solution is not more than about 5:1 (based on an OH- molar ratio).

24. The E_{op} aqueous bleaching solution of claim 21, wherein the pulp viscosity of the final chemical pulp produced using said E_{op} aqueous bleaching solution is at least substantially the same as the pulp viscosity of final bleached chemical pulp which is bleached with the same total amount of an E_{op} aqueous

bleaching solution comprising said peroxide, an oxygen-containing material compound, sodium hydroxide, with or without magnesium sulfate, in the absence of magnesium hydroxide.

25. The E_{op} aqueous bleaching solution of claim 21, wherein the pulp
5 brightness of E_{op} bleached chemical pulp produced using said E_{op} aqueous bleaching solution is at least substantially the same as the pulp final brightness of bleached chemical pulp which is bleached with a bleaching sequence containing the same total amount of an E_{op} aqueous bleaching solution comprising said
10 peroxide, an oxygen containing compound, sodium hydroxide, with or without magnesium sulfate, in the absence of magnesium hydroxide.

26. The E_{op} aqueous bleaching solution of claim 21, wherein the COD
of bleach effluent produced using said E_{op} aqueous bleaching solution is less than the COD of bleach effluent which is produced by the same total amount of an E_{op}
15 aqueous bleaching solution comprising said peroxide compound, an oxygen-containing material, sodium hydroxide, with or without magnesium sulfate, in the absence of magnesium hydroxide.

27. The E_{op} aqueous bleaching solution of claim 21, wherein the ratio
of sodium hydroxide to magnesium hydroxide in said E_{op} aqueous bleaching solution is not more than about 3:1 (based on an OH⁻ molar ratio).

28. The E_{op} aqueous bleaching solution of claim 21, wherein the ratio
20 of sodium hydroxide to magnesium hydroxide in said E_{op} aqueous bleaching solution is not more than about 1:2 (based on an OH⁻ molar ratio).

29. The E_{op} aqueous bleaching solution of claim 21, wherein the wet
zero span tensile strength of E_{op} bleached chemical pulp produced using said E_{op}
25 aqueous bleaching solution is at least substantially the same as the wet zero span tensile strength of bleached chemical pulp which is bleached with the same total amount of an E_{op} aqueous bleaching solution comprising said peroxide compound, an oxygen-containing material, sodium hydroxide, with or without magnesium sulfate, in the absence of magnesium hydroxide.

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30. The E_{op} aqueous bleaching solution of claim 21, wherein COD in the bleach effluent of said bleached E_{op} chemical pulp is at least about 5 % less than the COD in the bleach effluent of said bleached chemical pulp which is bleached with the same total amount of an E_{op} aqueous bleaching solution comprising said peroxide compound, an oxygen-containing material, sodium hydroxide, with or without magnesium sulfate, in the absence of magnesium hydroxide.

31. An E_p process for bleaching chemical pulp, which comprises:
providing said chemical pulp;
providing an E_p aqueous bleaching solution comprising a peroxide compound, sodium hydroxide and magnesium hydroxide, in the absence of magnesium sulfate; and

bleaching said chemical pulp with said E_p aqueous bleaching solution to form said bleached chemical pulp.

32. An E_p process for bleaching chemical pulp, which comprises:
providing said chemical pulp;
providing an E_p aqueous bleaching solution consisting essentially of a peroxide compound, sodium hydroxide and magnesium hydroxide; and

bleaching said chemical pulp with said E_p aqueous bleaching solution to form said bleached chemical pulp.

33. An E_p aqueous chemical solution for bleaching chemical pulp, which comprises an E_p aqueous bleaching solution consisting essentially of a peroxide compound, sodium hydroxide and magnesium hydroxide.

34. A process for bleaching chemical pulp, which comprises:
providing said chemical pulp;
providing an E_{op} aqueous bleaching solution;
bleaching said chemical pulp with said E_{op} aqueous bleaching solution to form E_{op} bleached chemical pulp;

providing an E_p aqueous bleaching solution comprising a peroxide compound, sodium hydroxide and magnesium hydroxide, in the absence of magnesium sulfate; and

bleaching said E_{op} bleached chemical pulp with said E_p aqueous bleaching solution to form E_p bleached chemical pulp.

35. A process for bleaching chemical pulp, which comprises:

providing said chemical pulp;

5 providing an E_{op} aqueous bleaching solution;

bleaching said chemical pulp with said E_{op} aqueous bleaching solution to form E_{op} bleached chemical pulp;

providing an E_p aqueous bleaching solution consisting essentially of a peroxide compound, sodium hydroxide and magnesium hydroxide; and

10 bleaching said E_{op} bleached chemical pulp with said E_p aqueous bleaching solution to form E_p bleached chemical pulp.

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